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MONTHLY REPORT - FEBRUARY 1981

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LA JOLLA, CALIFORNIA

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MONTHLY REPORT - FEBRUARY 1981

STATUS OF PUBLICATIONS

Published

Alvariño, Angeles, and John R. Hunter. 1981. New records of Alloposus mollis Verrill (Cephalopoda, Octopoda) from the Pacific Ocean. The Nautilus 95(1): 26-32.

Two specimens of Alloposus mollis (Alloposidae) captured off southern California are described and illustrated. The anatomical characteristics of the species are discussed, and its distribution is reviewed.

Dotson, Ronald C. 1980. Fishing methods and equipment of the U.S. west coast albacore fleet. NOAA Technical Memorandum, NMFS. NOAA-TM-NMFS-SWFC-8. December 1980, 126 pp.

Two fishing methods, trolling and baitfishing, are used by the U.S. west coast albacore fleet to capture albacore (Thunnus alalunga). This paper reviews the various methods and equipment used in both fisheries. A short history of the albacore is given, followed by detailed descriptions of the vessels, equipment, and techniques used. The trolling and baitfishing fleets are reviewed separately. Methods of locating fish using physical and biological clues are described, as are methods of caring for the catch until landfall. A final section on boat equipment and safety is included.

Hunter, John R., and Carol A. Kimbrell. 1980. Egg cannibalism in the northern anchovy, Engraulis mordax. Fishery Bulletin, U.S. (Note), 78(3): 811-816.

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

Lenarz, W. H., and P. B. Adams. 1980. Some statistical considerations of the design of trawl surveys for rockfish (Scorpaenidae). Fishery Bulletin, U.S. 78(3): 659-674.

This study is in two parts. The first part reviews statistical theory for choosing among random, stratified random, and systematic sample survey schemes when strata are of equal size and receive equal sampling effort. The theory is applied to data collected during a pilot trawl survey for rockfish in Queen Charlotte Sound, British Columbia, and a full scale survey along the coasts of Washington, Oregon, and California. The results indicate that on a scale of about 80 km, a systematic survey scheme provides more precise estimates than the other schemes. However, the differences in precision are slight and probably should not outweigh other factors such as logistical constraints in the design of trawl surveys. The second part of the study reviews statistical theory for sampling from negative binomial distributions. Results of the Queen Charlotte Sound pilot survey indicate that, except for fish with very low densities, numerous tows of short distances are relatively more precise than fewer tows of longer distances for trawl surveys of rockfish.

Mendelssohn, Roy. 1980. Improved bounds for aggregated linear programs. Operations Research 28: 1450-1453.

A method of Kallio for improving bounds on the optimal value of a linear program calculated from an intermediate iteration is used to improve Zipkin's bounds for an aggregated linear program. Both theoretical and computational results are given, demonstrating the improvement due to these new bounds.

Mendelssohn, Roy, and Matthew J. Sobel. 1980. Capital accumulation and the optimization of renewable resource models. J. Econ. Theory 23: 243-260. [U.S.] National Marine Fisheries Service, Southwest Fisheries Center, Honolulu Laboratory and the Far Seas Fisheries Research Laboratory of the Fisheries Agency of Japan. 1980. State of selected stocks of tuna and billfish in the Pacific and Indian oceans. Summary report of the Workshop on the Assessment of Selected Tunas and Billfish Stocks in the Pacific and Indian Oceans. Organized by the Honolulu Laboratory, Southwest Fisheries Center, National Marine Fisheries Service and the Far Sea Fisheries Research Laboratory of the Fisheries Agency of Japan. Shimizu, Japan, 13-22 June 1979. FAO Fish. Tech. Pap. (200), 89 p.

Available historical fishery information is summarized for the large tunas of major market importance. The information is current to 1977 in most cases and 1978 in some. Billfish fishery information is similarly reviewed for the Indian Ocean fisheries. Stock structure information and current research activities are also reviewed. Population parameters, regulations and/or recommendations are discussed. Skipjack tuna fishery information is not discussed.

Theilacker, Gail H. 1980. Changes in body measurements of larval northern anchovy, Engraulis mordax, and other fishes due to handling and preservation. Fishery Bulletin, U.S. 78(3): 685-692.

The relation between northern anchovy length and body parts was compared for live and laboratory-preserved larvae as well as larvae treated in a net to simulate field collections. Larvae were damaged by net abrasion, and those netted before preservation shrank more than those that were laboratory preserved (that is, larvae pipetted directly into preservative). Shrinkage of net-treated individuals decreased with age and increased with handling time, but shrinkage of laboratory-preserved larvae were constant for the size class studied. The results show that morphological differences reported for laboratory-reared and sea-caught larvae of the same length may result from the method of handling larvae prior to preservation.

Theilacker, Gail H. 1980. Rearing container size affects morphology and nutritional condition of larval jack mackerel, Trachurus symmetricus. Fishery Bulletin, U.S. (Note), 78(3): 789-791.

Approved by Center Director

Hewitt, Roger. Eddies and speciation in the California Current. For consideration for publication in California Cooperative Oceanic Fisheries Investigation Reports.

Ralston, Stephen, and Jeffrey J. Polovina. A multispecies analysis of the commercial deep-sea handline fishery in Hawaii. For consideration for publication in the Fishery Bulletin, U.S.

HONOLULU LABORATORY

INSULAR RESOURCES INVESTIGATION

Cruise to Northwestern Hawaiian Islands (NWHI) Completed

Richard N. U?hida, Leader of the Insular Ecosystem Study Task, reported that the NOAA vessel, Townsend Cromwell, returned to Snug Harbor, Honolulu, on Sunday, March 1, after completing a 40-day cruise to waters of the NWHI. The main objectives of the cruise were to continue surveys in the NWHI to 1) assess the distribution and relative abundance of the caridean shrimp, (Heterocarpus ensifer and H. laevigatus), kona crab (Ranina ranina), akule (Trachurops crumenophthalmus), and opelu (Decapterus macarellus); 2) conduct experimental trapping for spiny lobster (Panulirus marginatus) juveniles using small mesh traps; and 3) conduct fishing experiments with rectangular and half-round shrimp traps. Handline fishing and conventional lobster trapping stations were also occupied on a limited scale, mainly in those areas which had not been surveyed on previous cruises. The catches of shrimp were rather impressive in certain locales around Necker Island and French Frigate Shoals. Handline, kona crab, akule, and opelu fishing, however, were relatively poor in most of the areas visited. In addition, the Cromwell provided logistical support to Cooperating Scientists Audrey Newman, Sheila Conant, and Mark Rauzon, and Wildlife Biologist Eric P. Knudtson, who were conducting studies on seabirds and the Hawaiian monk seal on various islands in the NWHI.

Participating in the cruise were James H. Uchiyama, Chief Scientist, Thomas K. Kazama, Fishery Biologist, and Research Assistants Alan R. Everson, Robert L. Humphreys, Jr., and Gordon W. Tribble.

Preparation of Status Reports for Ciguatera Workshop Underway

With the help of Research Assistants Bernard M. Ito, Paul M. Shiota, and Darryl T. Tagami, and Computer Aid Karen Wendel, Richard Uchida began analysis of data for a status report on ciguatera sampling conducted around the NWHI, American Samoa, Guam, and the Northern Mariana Islands, to be presented at the upcoming ciguatera workshop scheduled for March 18-20 at the Honolulu Laboratory.

The study material includes 1,373 samples of fish and shellfish representing 64 species sampled between September 1977 and May 1980 on eight NWHI cruises of the Townsend Cromwell. Preliminary results indicate that of the 1,373 samples, 1,164 were negative, 103 were borderline, and 106 were positive in the radioimmunoassay (RIA) test. The RIA test was developed by Dr. Y. Hokama at the University of Hawaii's John A. Burns Schools of Medicine.

In another aspect of the ciguatera problem, Dr. Jeffrey J. Polovina, Statistician, assisted by Computer Programmer Sally H. Kuba, analyzed data on kahala (Seriola dumerili) sampled at the United Fishing Agency in Honolulu.

The results of the study will be included in a status report also to be presented at the ciguatera workshop.

Sampling Continues for Ciguatera Study

Physical Science Technician Bernard M. Ito reported that 226 kahala were sampled for ciguatera testing during February. Of the 226 fish, 41 (18%) were rejected owing to positive levels of ciguatoxin. In the same period last year (February 1980), of the 407 fish sampled, 41 (5%) were rejected. To date 4,783 kahala specimens have been sampled and 728 (15%) have been rejected for positive ciguatoxin levels. The kahala testing program is scheduled to end in May 1981.

* * * * * * * * * *

Research Assistant James L. Prescott examined stomachs of 10 caridean shrimp (Heterocarpus ensifer) and found body parts from shrimps, mostly pleopods, in 7 of the stomachs. Also included in the stomachs were foraminiferas, micromollusks, and other crustacean parts. Prescott indicated that the forage items were extremely small, usually less than 0.5 mm in size.

FISHERY MANAGEMENT PROGRAM

Plans Readied for Fishery Surveys

Gary L. Kamer, Statistician, continued to work with a contractor, Survey and Marketing Services, Inc., on the "Wholesale Fish Products Survey" and the "Vessel Inventory for Hawaii, American Samoa, Guam, and the Northern Mariana Islands." The "Wholesale Fish Products Survey" is currently at a critical stage because the results of a preliminary enumeration survey are being analyzed to determine the design specifics for the future monthly surveys. Concurrently, consideration is being given to the nature of the data collection form which will be used in this monthly survey.

The Vessel Inventory is at a stage where decisions must be made concerning what data should be collected at each site. Some additional information has been made available from Hawaii, and it is expected that information will be available soon from the other sites.

Fishery Statistics Training Session Held at Honolulu Laboratory

The Honolulu Laboratory and the Western Pacific Regional Fishery Management Council co-hosted a training session to familiarize contractors with the specifics of the contract objectives to collect historical fishery

data in American Samoa, Guam, and the Northern Mariana Islands. The kinds of data to be assembled, possible sources, and the importance that the data assembled be in computer compatible format, were discussed at length. The session was attended by Bill Coleman, Office of Marine Resources, American Samoa; Arnold Palacios, Department of Natural Resources, Northern Mariana Islands; Nancy Wong, Palau Fishing Authority; Margo Stahl, Glen Hayashi, and Ken Yoshida, Hawaii Division of Fish and Game; and Svein Fougner and Justin Rutka of the Council. Honolulu Laboratory staff in attendance were Laboratory Director Richard S. Shomura, Industry Economist Dr. Michael F. Adams, Operations Research Analyst George Liao, and Fishery Biologists Dr. Robert A. Skillman, Howard O. Yoshida, Fletcher V. Riggs, and Ray F. Sumida.

First Draft of Tuna Data Users Reference Manual Completed

In September 1980, a file management system for all tuna data maintained by the Honolulu Laboratory was started. Mark Scheele, Computer Programmer, has now issued the first draft of the Tuna Data Users Reference Manual. This manual provides information on specific data set names, data formats, procedures used in creating the data sets, and various information on the sources of the data. It also documents the procedures used in testing for errors, editing, redoing formats, renaming, documenting, and creating standard tape-based data files. These procedures were developed by Scheele under the supervision of Fletcher Riggs. A meeting will be held shortly to review progress made to date and to assign priorities to work remaining to be accomplished.

Honolulu Laboratory Data Management System Reviewed

Fishery Biologists Dr. Robert A. Skillman and Fletcher Riggs participated in a review of the Honolulu Laboratory's data management system, including an analysis of the functional steps and assignment of responsibilities for carrying out these steps. Riggs, with assistance from other Laboratory personnel, has now completed a proposal for submission to the Honolulu Laboratory Director on the reorganization of the Laboratory's data management system.

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Dr. Robert A. Skillman completed the second draft of his manuscript entitled "Tuna fishery statistics for the Indian Ocean and the Indo-Pacific." This manuscript has been sent to FAO's U.N. South China Sea Fishery Development and Coordinating Programme in Manila, Philippines, for review, pending receipt from them of the completed tables and figures.

Dr. Skillman also initiated a literature search to update the Matsumoto-Skillman skipjack tuna species synopsis which was originally issued as an Administrative Report in 1975.

Computer Package Developed to Attain CTD Data

In cooperation with the Univerity of Hawaii Department of Oceanography and the Hawaii Institute of Marine Biology staff, Fletcher Riggs developed a computer software package for attaining conductivity-temperature-depth (CTD) frequency data from tapes generated on the Plessey CTD Recorder on board the Townsend Cromwell. These frequencies are then converted to depth, temperature, conductivity, and salinity values and placed on a digital tape for routine computer analysis.

Hawaii Skipjack Tuna Landings Below Long-Term Average

The February 1981 Hawaii landings of skipjack tuna were estimated at 33.4 metric tons (MT), which is 2.6 MT below the February 1980 landings and 50.5 MT below the 1964-1980 long-term average for February. The cumulative landings from January through February were estimated at 64.5 MT, which is 15.3 MT below the 1980 landings for the same period and 139.9 MT below the 1964-1980 long-term average for the same period.

PELAGIC RESOURCES INVESTIGATION

More Spawning Experiments Readied for Upcoming Spawning Season

Dr. Andrew E. Dizon, Leader of the Pelagic Ecosystem Study, reported that the Kewalo Research Facility is being readied to continue work to induce spawning of skipjack tuna in anticipation of the approaching spawning season in Hawaiian waters. In preparation for the spawning and subsequent rearing of skipjack tuna larvae, University of Hawaii graduate student Sharon D. Hendricks and Research Assistant Linda A. Barraclough are re-establishing mass cultures of algae (Tetraselmis spp.) and rotifers (Brachionus plicatus). In addition, experiments are being conducted on the feasibility of mass culturing of the harpacticoid copepod (Tigriopus sp.) or Tahitian Isochrisis sp. Tigriopus sp. is a hardy, fast-reproducing copepod that will serve as an additional food source for skipjack tuna larvae.

Final Leg of Cooperative Squid Research Cruise Underway

Tamio Otsu, Chief of the Pelagic Resources Investigation, reported that the University of Hokkaido's Hokusei Maru left Honolulu on February 18 to complete the final leg of the Honolulu-University of Hokkaido cooperative squid research cruise around the Hawaiian Archipelago.

On the first leg of the cruise, 586 squid (231 pounds) were caught, mostly on the jigging machine; only 14 squid were caught in the gillnets. Bad weather hampered operations on the second leg and only 55 squid (24 pounds) were caught.

Participants in the first leg of the cruise included Fishery Biologist Walter M. Matsumoto and Research Assistant Bert S. Kikkawa from the Honolulu Laboratory; Dr. Richard Young, University of Hawaii; Ray Hixon, University of Texas; and John Shears, University of Hawaii graduate student. Don Worsencroft of Alika Cooper and Sons, Ltd., and David Jones, University of Hawaii graduate student, participated in the second leg of the cruise. After completing the final leg of the cruise, Matsumoto and Kikkawa will disembark the Hokusei Maru at Midway to return to Honolulu by air.

Dr. T. Suzuki, who was Co-Chief Scientist with Matsumoto on the first leg, returned to Japan on February 7. The Hokusei Maru is expected to return to Hokkaido on March 13.

Consultative Work Continues in Seabird Food Study

Thomas S. Hida, Fishery Biologist, and Research Assistant Michael P. Seki continued their efforts to identify previously unidentifiable items found in the spew of seabirds. Samples are still being sent to various experts for help in identifying unusual and important spew items. Crustacean items have been sent to Dr. Austin Williams of the Smithsonian Institution and fish eggs to Dr. Geoffrey Moser at the Southwest Fisheries Center, La Jolla. In addition, Fred Berry of the Miami Laboratory, Southeast Fisheries Center, has been asked for aid in clarifying the nomenclature of the amberjacks, and aid has been solicited from Dr. William Smith-Vaniz of the Academy of Natural Sciences in Philidelphia, Pennsylvania, on the nomenclature of two species of Decapterus. Hida is also waiting for specimens of Decapterus muroadsi from Dr. S. Motoda and Dr. Kubota of Tokai University, Shimizu, Japan, which may aid in the identification of Decapterus macarellus-type vertebrae in the spew samples.

DATA MANAGEMENT AND TECHNICAL SERVICES

Computer Account for Monk Seal Study Established

This month George Liao, Operations Research Analyst, established computer accounts and discussed processing requirements with Hawaiian monk seal study contractors Pattie and Brian Johnson, and Craig Harrison, Wildlife Biologist with the U.S. Fish and Wildlife Service. Liao also advised Harrison on searching interactive bibliographic data bases regarding Pacific Island ecosystems.

* * * * * * * * * *

DMTS staff members worked with Fletcher Riggs and other Laboratory personnel on a draft Laboratory data management plan and also took part in the deliberation of the ad hoc Data Management Committee. In addition, computer batch procedures and interactive modules were documented.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

ALBACORE FISHERIES PROGRAM

Satellite Remote Sensing Applications in Fisheries Research

Satellite Images Used as Fishery Aid to Catch Albacore

Infrared imagery from the NOAA-6 satellite was used recently as an aid to fishing strategy in support of an exploratory fishing survey conducted cooperatively by the American Fisherman's Research Foundation (AFRF) and the SWFC. Three fishing vessels on charter to AFRF conducted longlining and trolling for albacore in a region 200 to 900 nautical miles west of San Diego, January 13 through February 10. During the survey Randee Recht, Remote-sensing Specialist, processed 56 images from 23 satellite passes collected prior to and during the survey period via the Scripps Remote Sensing Facility. With the assistance of Oceanographer Ron Lynn, ocean thermal fronts were copied from three of the images and sent to the vessels in real-time via radio facsimile.

While large cloud decks obscured the operational area during most of the 30-day period, several modest-sized clearings were found. A very large clearing was recorded on February 9 during the inbound leg of the survey. This image, reproduced in Figure 1, reveals several major thermal fronts associated with subtropical and transition zone waters and covers an area of one million square kilometers. The track of the three vessels for February 5 through February 9 is shown as a dashed line. From 10 to 30 albacore were caught by each vessel each day with trolling gear, February 6 to 8. After the vessels crossed a front into cooler waters near 123° W longitude, only two albacore were caught by one vessel.

Recht has rescaled this large-area image into six images for higher resolution. She worked with a local photo-processing laboratory to preserve as much detail and resolution as possible in photo records of the images. These images provide an important input to a report on the exploratory fishing survey being written by the staff of the Albacore Oceanography Group.

Dr. R. M. Laurs and other albacore staff members provided the planning and scientific coordination for the survey. Fishery Biologist Robert Nishimoto, and Biological Technicians Ron Dotson and William Flerx took part in the survey aboard one of the fishing vessels.

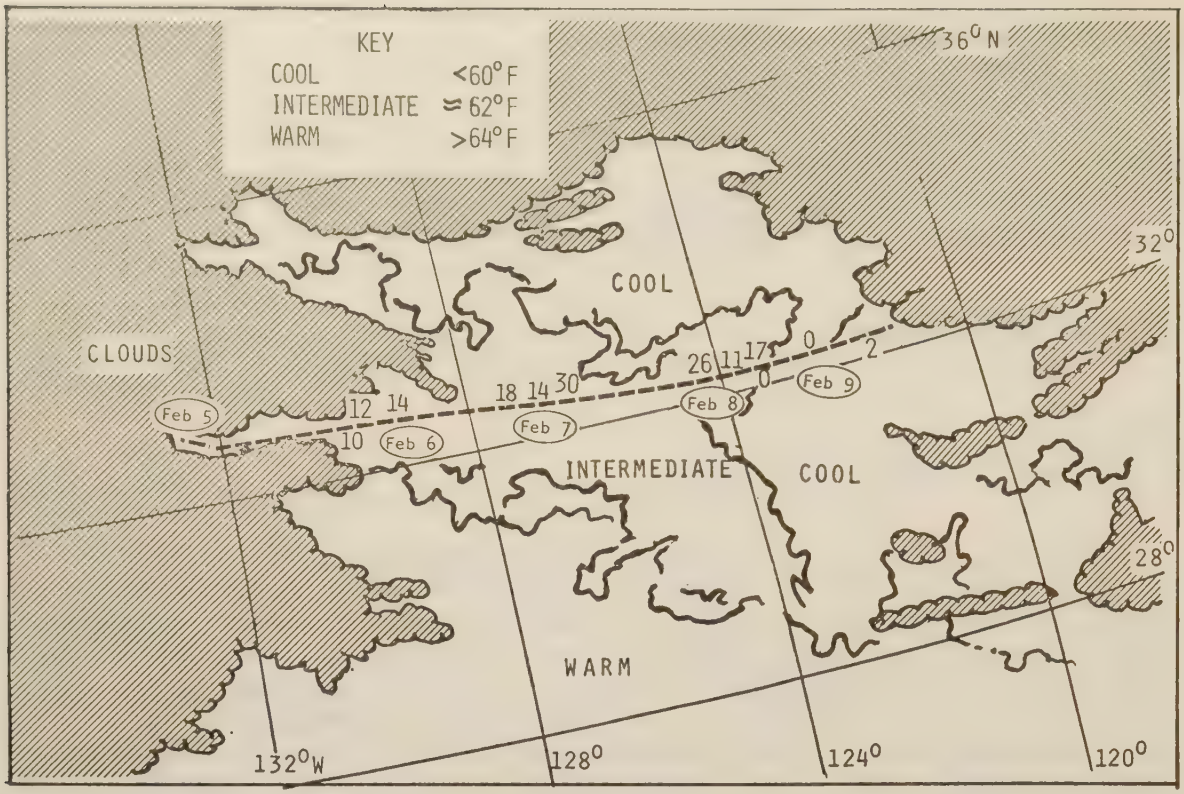

Figure 1. Reproduction of an infrared image from the NOAA-6 satellite. Thermal fronts for February 9, 1981, are shown as solid, meandering lines. The ship track, from February 5-9, is indicated by the dotted line. Dates and albacore troll catches are plotted along this line. The shaded areas indicate cloud cover.

Data From NOAA-6 and Nimbus-7 Satellites Analyzed

Jose Pelaez, SIO graduate student working with Dr. Reuben Lasker and Dr. R. M. Laurs, has been analyzing satellite data collected contemporaneously with the October 1980 cruise of the Scripps Institution of Oceanography's research vessel, New Horizon. This vessel was performing a study of internal wave activity within the southern California region. Pelaez has also been experimenting with the calibration of Nimbus-7 Coastal Zone Color Scanner imagery collected on satellite passes over the coastal waters off southern California.

Collection as well as preliminary analyses of NOAA-6 and Nimbus-7 imagery has been maintained in support of the monthly cruises of this year's CalCOFI program. This archive originated October 1 and will continue until the last cruise in August.

Satellite Imagery Support Planned for Study of Upwelling Plumes

Remote-sensing Specialist Randee Recht and SIO graduate student Jose Pelaez are preparing to provide real-time support for a study of upwelling plumes off Point Conception, California. Dr. Richard Dugdale, University of Southern California, and Dr. Reuben Lasker, Leader of the Coastal Fisheries Resources Division, will be aboard the USC research vessel, Velero, conducting a small-scale survey within and across the plume boundaries. Recht and Pelaez will provide processed infrared satellite images showing the thermal fronts of the plumes on a daily basis, clouds permitting. The images will be sent to the vessel via radio FAX. Trail images of passes have already been successfully processed, transmitted, and received aboard the Velero. The imagery received in real-time will be used to determine an effective sampling grid.

LARVAL FISHES, COASTAL EAST PACIFIC

Paper Describing Rare Octopus Pubished

In January, Dr. Angeles Alvariño and Dr. John R. Hunter published a paper entitled, "New records of Allopsus mollis Verril (Cephalopoda, Octopoda) from the Pacific Ocean." The paper described two specimens of Allopsus mollis, both females, taken off California (32°23' N-117°43' W and 33°31' N-117°58' W) in midwater trawls by the NOAA research vessel David Starr Jordan, on July 18, 1976 and March 24, 1977, respectively. This mesopelagic cephalopod is rarely captured, and records of the species are few and scattered world-wide. Previously published illustrations and descriptions have been incomplete and diagrammatic, due to a lack of well-preserved specimens. The two individuals taken by the Jordan, however, were in an excellent condition of preservation, resulting in better descriptions and illustrations than had heretofore been possible.

The paper also includes a revision of the distribution of specimens by previous authors, with details on size, sex, and other anatomical features; depth of capture; and temperature of the waters. Some discussion is included on the taxonomic characteristics, bathymetric distribution, and the species importance in the food web of the oceans: Marine mammals such as dolphins and sperm whales, turtles, Thunnidae, sharks, and other large fish, feed on these cephalopods.

Chaetognathae From India Analyzed

Dr. Angeles Alvariño, Fishery Biologist, reported that she worked this month on the identification of Chaetognatha material from the region of Bombay, India, sent by the National Institute of Oceanography of India. Specialists at the Institute thought the specimens belonged to a new species;

Dr. Alvarino found that the specimens sent corresponded to Sagitta neglecta Aida 1897, a widely-distributed species in the tropical-equatorial Indo-Pacific region.

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Dr. Alvariño also continued work on the biotic and abiotic characteristics found at locations with high concentration, and with absence of larvae of Trachurus symmetricus, Merluccius productus, and Sardinops caerulea, off California and Baja California, for the monthly CalCOFI cruises of 1954, 1956, and 1958. Some data on the seasonal cruises of 1969 will aslo be analyzed. In addition, Dr. Alvariño has corrected the press proofs of a monograph, in Spanish, on the Siphonophores of the South Atlantic. The data included in this work were compiled during the preparation of the monograph on the "Siphonophores of the Pacific, with a Review of the World Distribution," published by the University of California Press in 1971.

A manuscript on the distribution, life cycle, and structure of the population of S. scrippsae off California and Baja Califoria, is now being prepared for publication.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Jack Mackerel to be Included in Groundfish Plan

In the spring of 1980 the Pacific Fishery Management Council discontinued development of a Jack Mackerel Plan. However, because this fish is commonly taken as incidental catch in the Pacific whiting (hake) fishery, the Council decided at its February meeting to include jack mackerel in the "other fish" category of the Groundfish Plan. Unfortunately, the jack mackerel issue may delay implementation of the Groundfish Plan, which was finally accepted by the Council at the February meeting. As revised, the Groundfish Plan will be concerned only with jack mackerel catches north of 39° N latitude, and does not establish a numerical optimum yield for the species.

1979 and 1980 CalVET Tows Compared in Continuing Investigation of Anchovy Biomass Parameters

This month Susan Picquelle, Statistician, examined two data sets describing anchovy eggs taken by CalVET tows during 1979 and 1980. The 1979 data set was compared with the 1980 data set by examining the sample characteristics that are known to affect the abundance of anchovy eggs in the sample, i.e., time of year, time of day, region, and temperature.

The major task for this project was to put the data sets into comparable forms. First, Nate Kostrubala, Computer Aid, added a region code to the data

sets via a program that converts line and station number to the CalCOFI region. The data were then recorded to put the two data sets in exactly the same format. The 1979 data set had to be further manipulated because eight replicate tows were taken at each station; Picquelle, therefore, wrote a program to reduce the data sets to one record per station instead of one record per tow. Finally, the two data sets were reduced to include only positive stations, i.e., those stations where anchovy eggs were present in the tow.

Picquelle used minitab to tabulate and summarize the data sets. She made the following observations:

1. Time of year: The 1979 sample was taken during January and February; the 1980 sample was taken during March and April.

2. Time of day: Both data sets had similar distributions of tows over the 24-hour period.

3. Region: In 1979 the majority of positive stations were in CalCOFI Region 7. In 1980, the positive stations occurred in Region 4, 7, 9, 11, and 13.

4. Temperature: The temperatures in 1979 were colder and less variable than the temperatures in 1980.

Multispecies Fisheries Model Under Development

Gordon (Mike) Phillips, graduate student economist at the La Jolla Laboratory, is developing a microeconomic model of fishermen's choice, which will be applied to the problem of forecasting the allocation of fishing effort by the southern California wetfish fleet among six fish species. This model is expected to help analyze the economic impact across the fishery of anchovy, mackerel, or other species-specific regulations. The effort should ultimately contribute to the formulation of multispecies fishery management plans. A key innovation by Phillips is the attempt to account for diverse fishing behavior among fishing vessels and through time.

The theoretical foundations of the model begin with economic assumptions about the behavior of a stylized "typical" fisherman. These assumptions are now being used to specify a nonstationary interactive Markov chain, which relates the aggregate fleet behavior yesterday to the aggregate fleet behavior today, with a transition probability matrix. "Nonstationary interactive" means that the stochastic process is not expected to satisfy various ergodic assumptions; rather, the transition probability distributions are allowed to be functionally dependent on previous states and on other exogenous and endogenous variables such as relative prices and lunar cycles.

Estimation of these probability distributions will be performed using constrained maximum likelihood techniques on California landings data for 1974-1976. Because these data are for individual boats, estimation will be based on actual a posteriori transition probabilities.

A preliminary version of the model is anticipated by June 1, 1981.

Report on Power Plant Impact Drafted

This month Alec MacCall, Marine Biologist with the California Department of Fish and Game, completed a first draft of a paper entitled "Power plant impact assessment: Integrated fishery production model approach"; a section on example applications remains to be completed by his coauthors. The method discussed in the paper should be useful not only to assess the effect of the power plant on the environment, but will also show how the impact of power plants may be incorporated in fishery asessments.

SURVEY SYSTEMS DEVELOPMENT AND EVALUATION

Isolating Mechanisms of Cyclonic Eddies Considered in Paper

Roger Hewitt, NOAA Corps, completed a paper this month which speculates on an aspect of the biogeography of the California Current. The idea stemmed from the observation of population breaks for several invertebrate and vertebrate species, including at least three major commercial pelagic species, in the vicinity of Pta. Eugenia, Baja California. The Pacific Environmental Group (PEG) has confirmed and expanded the description of the California Current and documented the existence of semi-permanent cyclonic eddies north and south of Pta. Eugenia. It is suggested that these eddies play a role in the recruitment of pelagic larvae to adult populations in these areas, and that the limited communication between the eddies may be a mechanism for isolation and speciation. Several predictions were made as a means for testing this hypothesis.

Atlas of Northern Anchovy Larvae Distribution Completed

Roger Hewitt reported that an Atlas of northern anchovy larvae distribution has been prepared from information obtained on survey cruises during 1966 through 1979. Hewitt digitized the maps and was able to confirm several visual impressions of gross features of the geographic patterns: between and within year shifts in the center of spawning of variations in the duration and timing of the seasonal peak of spawning effort, and comparisons of the total reproductive output in a season. The Atlas is currently at the printers and should be available soon.

Oceanic Fisheries Resources Division

TUNA/BILLFISH RESOURCES PROGRAM

International Skipjack Year Tags Recovered in Puerto Rico

Eugene Holzapfel, Biological Technician, has been assigned the task of receiving International Commission for the Conservation of Atlantic Tunas (ICCAT) tags in Puerto Rico. A large number of tags are being recovered by cannery workers in Puerto Rico as the result of ICCAT's International Skipjack Year Program (ISYP) tagging project. Holzapfel has been collecting the tags recovered from Atlantic tunas transshipped to or landed in Puerto Rico since June 1980. The 1980 ISYP, in which 19 countries are participating, began in 1979 and intensive tagging of skipjack tuna has taken place in 1980 and 1981.

North Pacific Albacore Data Base Assembled

Fishery Biologists Earl Weber and Tony Majors, and Mathematician Al Coan completed assembling a North Pacific albacore data base containing information on the North American albacore fishing fleet. This data base contains nominal catch-and-effort, standardized catch-and-effort, and length-frequency of fish caught. Area, time, and gear-specific summaries have also been compiled. This new data base is expected to faciitate smooth handling of data for upcoming analyses and reports on North Pacific albacore.

MARINE MAMMAL BIOLOGY AND TECHNOLOGY PROGRAM

Sixth International Meeting on Marine Mammals of Baja California, Held in La Paz, Mexico

Dr. Douglas DeMaster, Leader of the Coastal Marine Mammal Program, presented a paper entitled, "Research projects of the Coastal Marine Mammal Program of the SWFC in 1979-80" at the "VI Reunion Internacional Sobre Mamiferos Marinos de Baja California" held in La Paz, Mexico, from February 11-13, 1981. The paper reviewed the research accomplishments of the Coastal Marine Mammal Program, including a fisheries-conflict study contracted to the California Department of Fish and Game (joint contract by the Southwest Region [SWR] and the Southwest Fisheries Center [SWFC], the Cooperative Marine Mammal Salvage Program, two cruises of the David Starr Jordan dedicated to coastal marine-mammal research, and two additional contracted studies on Tursiops (Los Angeles County Museum) and Lagenorhynchus (Hubbs/Sea World Research Institute). Fifteen papers were presented during the first 2 days of the

meeting. On the third day, field trips to a sea-lion rookery and to Magdalena Bay were arranged. During the meetings, Dr. Bruce Mate, Oregon State University, and Dr. DeMaster arranged with the Centro de Investigationes Biologicas (C.I.B) to investigate problems in marking and immobilizing sea lions. Three weeks of field work are planned for May 1981 near La Paz.

Coastal Marine Mammal Research Plan Discussed

A series of meetings concerning research plans for coastal marine mammals were held in February. Dr. Douglas DeMaster, in charge of the Coastal Marine Mammal Program, organized the meetings with SWFC, SWR, and California Department of Fish and Game (CF&G) personnel to discuss research plans for 1981-1985. The long-term goal of SWFC's research was defined as research on the biology and ecology of marine mammals of the California coast, which will enable assessments of population status and development of management advice. The short-term goals are to assess the condition of the Zalophus and Mirounga stocks in 1984; Phoca, Globicephala and Tursiops stocks in 1985; and to investigate line-transect survey techniques in 1982. Research activities and goals of CF&G were also discussed and considered in the SWFC plan.

Progress Made in "Sundown Sets" Analysis

This month James M. Coe, Fishery Biologist, and Charles W. Oliver, Computer Specialist, completed a computer data format and definition-description of variables to be included in a detailed analysis of "sundown sets." Previous analyses by National Marine Fisheries Service personnel have indicated relatively high porpoise mortality in sets made on porpoise schools in the late afternoon. The apparent reason for the higher kill is the effect of darkness on the vessel's "backing down" rescue procedures, but details of the causes of mortality are not yet clear. Regulations for the 1981 season prohibiting sets within the 90 minutes prior to sundown, have been suspended, pending further review. This analysis will be part of that review.

Development of a data file for the analysis has been ongoing with input from tuna industry and scientists working for the Inter-American Tropical Tuna Commission (IATTC), so that the file could serve as a common data base for evaluating fleet performance of sundown sets. When completed, the file will include NMFS observer data collected during 1977-1980 as well as IATTC data for 1979-1980. Computer programs to reformat the NMFS data have been written, tested, and executed. Beginning in March, summary statistics of the NMFS data will be produced and analyses will begin. Programming to reformat IATTC data will also be completed in March.

A highlight of the work to date is the use of a computer algorithm to calculate the local time of celestial events, incldng sundown. The algorithm was obtained from Roger Hewitt of the NOAA Corps, and incorporated into NMFS computer routines. Given a position and date, the algorithm calculates sunrise and sunset times, as well as the times of astral, nautical, and civil twilights. The program is accurate to within $\pm$ 3 minutes for locations between 30° S and 30° N latitude. The algorithm is also used in editing observer data that sometimes do not specify local time when a set is made.

SWFC Scientist Lectures at Midwestern Universities

Dr. Warren E. Stuntz, Fishery Biologist, has returned from a visit to Ohio State University and the University of Wisconsin at Madison, where he gave several lectures on the tuna/porpoise problem, at the invitation of the two universities. While in Ohio, Dr. Stuntz presented a lecture sponsored by the Department of Zoology and by the Department of Natural Resources, and also met informally with several graduate students. In addition, he gave a lecture at the combined annual meeting of the Ohio Chapter of the American Fisheries Society, the Ohio Chapter of the Wildlife Society, and the Ohio Wildlife Managers Society. While at the University of Wisconsin, Dr. Stuntz spoke to a class on ecology of fishes and to a group from the Departments of Zoology, Wildlife Ecology, and Oceanography and Limnology. The faculties and graduate students at both universities are working on a variety of fisheries-related projects; much of the work involves questions on optimal foraging and community ecology.

Evaluation of Fluorescent Pigment for Dolphin Tagging Discs Completed

Ray Stives, Biological Technician, and Jacqueline Jennings, Fishery Biologist, have completed an evaluation of three DAY-GLO fluorescent pigments as possible colorants for dolphin disc tags. Fluorescent colors were considered because of their high visibility. The 2-month study was designed to evaluate the effect on fluorescent-color polyurethane disc tags from exposure to sunlight while in a marine environment.

Within 1 to 2 weeks, all three pigments had faded by approximately 50%, and continued to fade during the remaining 6 weeks of the test. The fluorescent pigments proved to be too sensitive to ultraviolet exposure to be used for dolphin disc tags.

Batch-Preparation of Teeth from Spotted Dolphins Continues

Biological Technicians Priscilla Sloan and Drew Stanley, Fishery Biologist Makoto Kimura, and Zoologist Aleta Hohn continued progress toward the goal of preparing 1600 decalcified and stained thin sections of teeth for the reevalulation of spotted-dolphin age composition. As of this writing, a total of 500 mounts have been prepared by the batch-processing method largely developed by Sloan.

Stanley and Hohn, newly added to the project, spent their first several weeks familiarizing themselves with the laboratory techniques. In addition to her laboratory work, Hohn, who has specialized experience in dolphin dental histology, will work closely with Dr. Al Myrick to provide indpendent readings on the teeth samples.

Software Debugged for Micro-digital Enhancement of Dolphin Tooth Layers

Dr. Al Myrick has received and is currently "debugging" the computer software for the digital enhancement system acquired to improve the repeatability of counts of layers in dolphin teeth being studied for age determination. The system, consisting of a closed-circuit TV camera mounted atop a compound microscope, a TV monitor, a keyboard, a microcomputer, and an impact printer, will be used in efforts to improve the repeatability of layer counts through manipulation of light-transmission patterns of the layered tissues. The system is designed to transmit tooth-layer-pattern image informtion from the camera to the keyboard-monitor, where it can be manipulated. The information is then passed to the microcomputer, which transforms the modified image into numerical code groups representing 16 light-level combinations. Theoretically, the system should read, measure, and identify repeating patterns (as code groups), enabling the operator to define the layered units on an objective basis.

Contract Report Received from University of Hawaii

The final contract report on chemosensory attracting and guiding of yellowfin tuna (Thunnus albacares) has been received from Walter Ikehara and Dr. John Bardach of the University of Hawaii. The report details olfactory responses of yellowfin tuna to various chemical fractions of prey substances. Behavioral responses indicated that the proteinaceous fractions were the active portions. Extracts made from whole organisms elicited a stronger response than did synthetic mixtures. The greatest response, however, was elicited by adding some amino acids to a squid extract. This combination was tested aboard a purse seiner to evaluate the possibility of using the odor in separating tuna from dolphins during a set. Although some positive responses were observed for a few fish, the technique was judged ineffective in this situation although it may still prove valuable in alternative fishing methods.

MARINE MAMMAL MONITORING AND ASSESSMENT PROGRAM

Test of Marine Mammal Aerial Survey Assumptions Underway

A field party under the leadership of Dr. Rennie Holt, Operations Research Analyst, is currently in Costa Rica, taking part in an experiment designed to test several key assumptions which have been made in estimating the density of porpoise schools in the eastern tropical Pacific. Other La Jolla Laboratory personnel in the party include Computer Specialist Frank Ralston, Biological Technicians Bill Brinkerhoff and Mark Lowry, and Biological Technician Larry Hansen; Bill Walker of the Los Angeles County Museum is also taking part.

An AT-11 airplane has been contracted through Aeromarine, Inc. in Connecticut for the duration of the study. It is anticipated that the experiment will extend into March or April 1981.

The principal hypothesis to be tested is the detectability, under a range of environmental conditions, of large schools of porpoise which are directly beneath the airplane. The principal conditions being considered are sea state and sun angle; similar flights will be made seaward from Costa Rica under a range of sea states, and with different orientations to the sun. Comparisons will also be made between the performance of experienced and inexperienced observers.

The hypothesis of no difference in detectability will be tested by comparing the density estimates obtained under two classifications of sea state and two classifications of sun angle. In addition, the possibility of missing schools directly on the trackline by the forward observer will be partially checked by having a second team member monitor the trackline to determine if the forward observer misses any large school.

The results of this study will prove useful in further evaluation of the reliabiity of porpoise school density estimates made from aerial survey data.

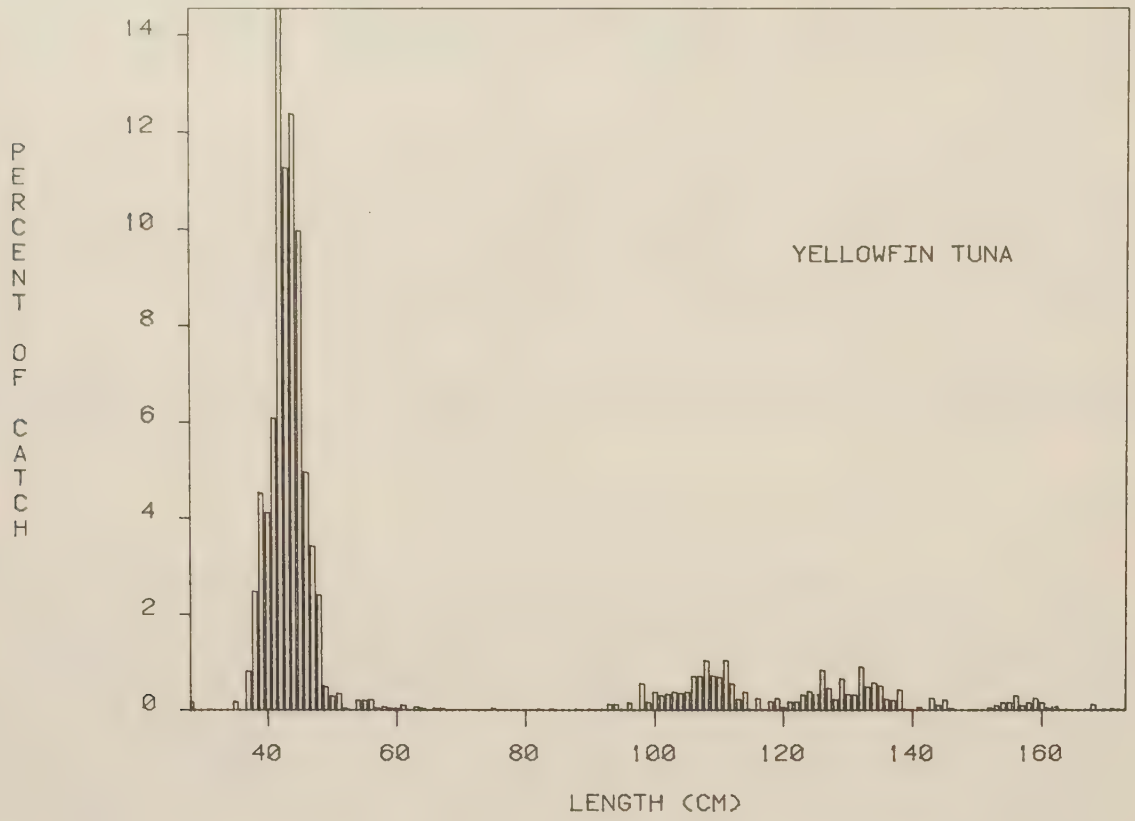
Atlantic Fishery Statistics Submitted to ICCAT

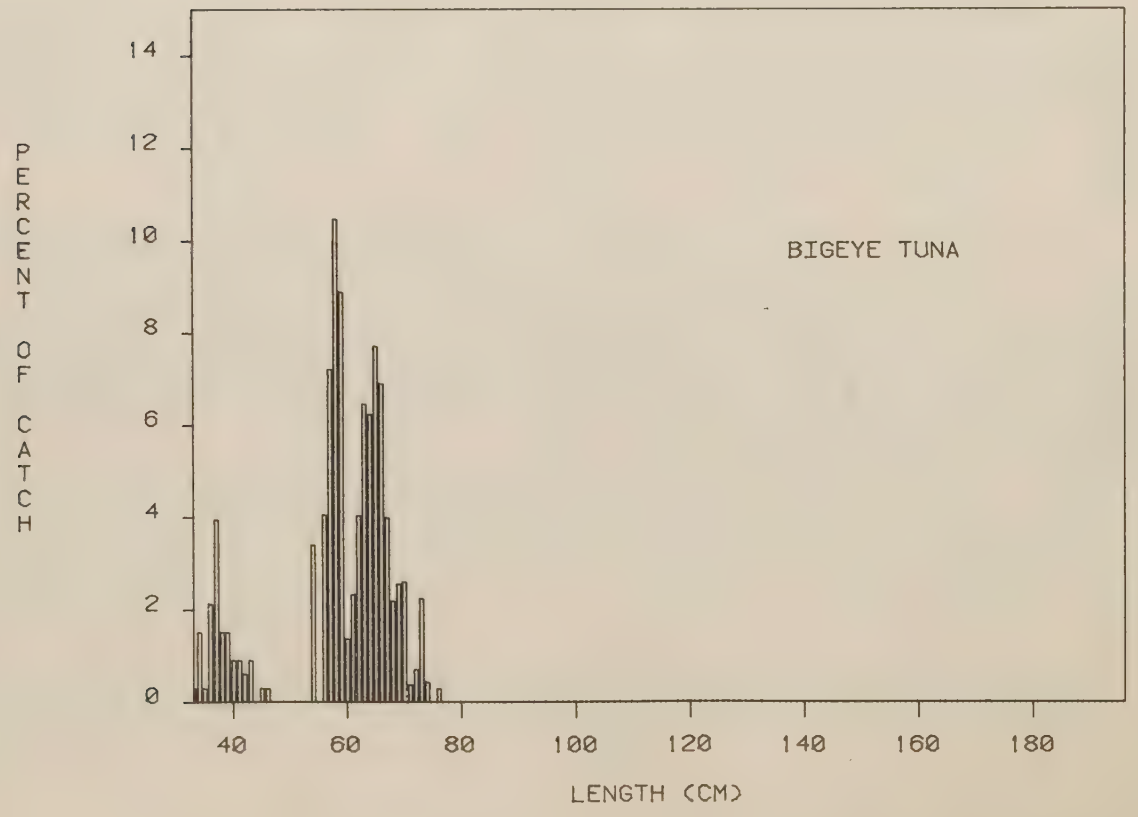
Al Coan, Mathematician, and Robert Nydam, Computer Programmer, completed a summary of preliminary 1980 Atlantic tuna fishery statistics for the United States tropical tuna fleet, and statistics on transshipments of foreign-caught Atlantic tunas to Puerto Rico. U. S. fishery statistics include total catch, catch-and-effort from logbooks, and length-frequency of fish landed. Transshipment statistics include partial landings and length-frequency of fish landed. The summaries are submitted annually to the International Commission for the Conservation of Atlantic Tunas (ICCAT) as part of the organization's requirements.

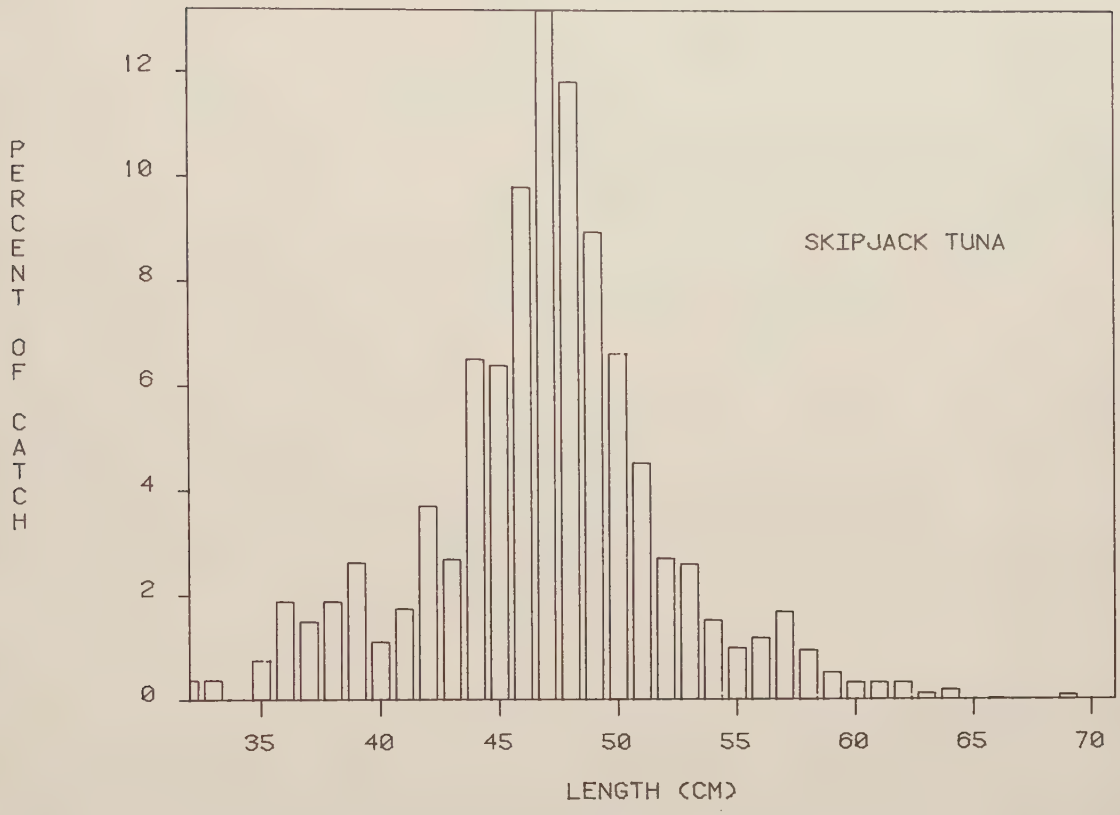
In 1980, six U.S. purse seiners participated in the Atlantic Ocean tropical tuna fishery and caught approximately 4,800 metric tons of yellowfin, skipjack, bigeye, albacore, and little tunny. Catches were made from April to September and were mainly concentrated in the Gulf of Guinea. A total of 1,362 fish were sampled for length-frequency. Sizes of fish taken in the eastern Atlantic are shown in the figures on the following pages.

During 1980, 3,169 yellowfin tuna, 2,116 skipjack tuna, 735 bigeye tuna, and 509 albacore from catches of foreign baitboats, purse seiners, and longliners that transshipped their catches to Puerto Rico, were sampled for length-frequency. Most of the sampled catches were from the Gulf of Guinea area. Fifty to 80% of the transshipped catches of yellowfin and bigeye were of small fish (< 55 cm fork length). Purse seine gears accounted for the majority of these small fish.

The following three figures are annual size composition of tunas caught by U.S. purse seiners fishing in the eastern Atlantic in 1980.






PERCENT OF CATCH
12
10
8
6
4
2
0
SKIPJACK TUNA
35
40
45
50
55
60
65
70
LENGTH (CM)

TIBURON LABORATORY

FISH COMMUNITIES INVESTIGATION

Groundfish Management Plan Approved for Submission to Secretary of Commerce

Dr. William H. Lenarz, Leader of the Rockfish Analysis Task, participated in a meeting of the Groundfish Management Plan Development Team and the Pacific Fishery Management Council in Coos Bay, Oregon, February 17-19, 1981. During the meeting, the Council approved the Groundfish Management Plan for submission to the Secretary of Commerce. If the Secretary approves, and the projected time schedule is followed, the Plan will be implemented in January 1982. Because of the complex nature of the fishery and the imprecise knowledge of the status of many stocks of groundfish, the Plan is designed to be flexible. Management options adopted permit moderate increases in catches, both within season and between years, if stock conditions allow; at the same time, these options provide for a variety of management actions if conditions indicate the need to do so. A management team to advise the Council on conditions of the stocks will be chosen at a later date.

King Salmon Investigated as Rockfish Predators

As part of a study on major rockfish predators, Peter B. Adams, Fishery Biologist on the Predator-Prey Task, has completed editing the first year's data for king salmon (Oncorhynchus tshawytscha). The diet of king salmon is divided seasonally into three distinct phases. From early February, when sampling begins, to mid-May, the salmon diet is dominated by the euphausiid Thysanoessa spinifera. From mid-May to July, the diet is a mixture of euphausiids and fish; the fish are predominantly rockfish, the major species being shortbelly rockfish (Sebastes jordani). From August to the end of the season in early November, anchovies (Engraulis mordax) form almost the entire diet of the king salmon. It is known that anchovies in southern California change their schooling behavior, becoming more available to purse seining, at about the same time of the year that they dominate the king salmon diet. The reasons for the other shifts in diet are not immediatedly obvious, although accompanying shifts in the location of the major concentrations of fish have been observed. Collections will continue at least throughout this year to investigate the causes for these shifts further.

Charter Vessel Locates Possible Source of Commercial Quantities of Rex Sole

A charter by staff of the Fisheries Development Investigation may have located a source of commercial quantities of rex sole in the deep waters off southern central California this month. A 50-minute tow by the chartered

commercial trawler, Sanibel, caught about 550 pounds of rex sole at 250 fathoms. Over 300 pounds of other species (including Dover sole, shortspine thornyhead, aurora rockfish, blackgill rockfish, and sablefish) were taken in the same tow.

The catch results from this cruise were generally similar to those of an earlier cruise (in 1976) in the same area by the NOAA research vessel, David Starr Jordan. Large individuals of Dover sole, sportspine thornyhead, and blackgill rockfish were found, but in less-than-commercial quantities. Sablefish were smaller in size, and much fewer in number. However, large male tanner crab (Chionoceyes tanneri), as well as smaller berried females, were found at 400 fathoms. In addition, a single individual of a giant mysid (genus Gnatheuphausia), some "jelly octopus" (Opistoteuthis), and a "vampire octopus" (genus unknown) were caught.

Participants on the February 4-8 cruise included Sus Kato (Cruise Leader) and Patrick Rutten (NOAA Corps) from the Tiburon Laboratory, and Bob Laurent from the Morro Bay Office of the California Department of Fish and Game (who was onboard February 5-7). Local fishermen from Morro Bay and Avila Beach helped formulate plans for fishing strategy and localities for the cruise. They (and others) will be sent a detailed report of the cruise results, which are now being tabulated.

Charter Cruise Postponed

A charter cruise scheduled to begin March 3 has been postponed because the vessel, F/V Colantino Rose II, suffered a fire in the engine room. The chief objectives of the cruise, which has been rescheduled to begin March 16, are to collect market and biological samples of shortbelly rockfish and euphausiids, and to test a new "semi-pelagic" trawl to learn its efficacy in avoiding a large-by-catch while targeting on shortbelly rockfish.

Trial Octopus Fishing Begins

Eric Anderson, a Fort Bragg fisherman, started fishing for octopus this month, using traps supplied by the Tiburon Laboratory. The traps, which are constructed of redwood, are similar to those used by the Japanese fishery for Octopus dofleini, the species common off Fort Bragg. Much interest is focused on this attempt, and several fishermen are ready to enter the fishery should it prove economic. Project leader Lieutenant Patrick Rutten (NOAA Corps), Biological Aid Susan Pollock, and Fishery Biologist Sennen Salapare are constructing more traps, to be used in northern and southern California by cooperating fishermen.

Euphausiid Fishing Trial Unsuccessful

Fishery Biologists William Leet and Sennen Salapare accompanied the commercial trawler, Seal, on February 19 in an attempt to catch euphausiids off Bodega Bay, California. Although a distinct scattering layer was seen on

the echo sounder, no euphausiids were caught in the large midwater plankton trawl, which was towed right through the marks. In previous fishing trials off Monterey, the scattering layer appeared to be closely associated with euphausiids. Further trials will be made to determine if the gear functioned properly or if the euphausiids were simply not present.

PHYSIOLOGICAL ECOLOGY INVESTIGATION

Analyses of Serum Proteins in Striped Bass Completed

Dr. Jeannette A. Whipple, Supervisory Fishery Biologist, and Michael Bowers, Biological Technician, have completed analyses of serum proteins in blood of striped bass collected from the San Francisco Bay-Delta, Coos River, Oregon, and Lake Mead, Nevada. Blood samples from approximately 300 fish of all age groups, and from eight sampling locations, have been examined. Using techniques he developed with cellulose acetate plates, Bowers was able to separate nine major areas of serum proteins, and from 10 to 20 total serum protein bands. In addition, densitometer charts have been assessed and all data entered on coded data sheets for computer analyses.

Analysis shows that the relative quantities of certain protein bands vary among striped bass age groups and sampling locations. Lower quantities of serum proteins are correlated with certain reproductive stages and with disease or parasitism. Some intraspecific genetic variation may also be present, but verification of this depends on statistical analyses currently being done. Serum protein bands are also being assessed in relation to approximately 100 other characteristics measured for each fish, including inherent characteristics which may be genetic, and factors of age and sex, as well as the relationship of variability in proteins with pollutant loads (e.g., petrochemicals). Further work attempting to identify the major proteins represented is also in progress.

Special Meeting Held to Review Data Available on Status of California Striped Bass Population

Fishery Biologists Dr. Jeannette A. Whipple and Maxwell Eldridge, along with other invited scientists and resource managers, participated in a special meeting at the California Department of Fish and Game in Stockton, California, on February 10-11, 1981. The participants' purpose at this meeting was to review data available on the status of the California striped bass population. The adult fish population has steadily declined over the past 10 years, and a dramatic decrease in the numbers of all life stages of bass has occurred since 1977. In addition, other changes in the San Francisco Bay-Delta estuary have taken place which suggest causative factors are not solely restricted to the striped bass.

Research efforts of the Physiological Ecology Investigation staff in the past 5 years have been directed at determining what the controlling factors affecting the striped bass population are, from both a laboratory and a

physiological perspective. The different factors, operating for each life stage, have been hypothesized, and research on the early life stages has indicated that there is considerable significant variabilty in the size, quality, and viability of eggs between different females. As a consequence, embryonic and larval survival and growth are directly affected. Detailed autopsies of spawning fish have indicated that fish in poor condition (heavily parasitized, low condition indices, etc.), and heavily burdened with pollutants, produced smaller, less viable eggs. Work to determine what caused the initial poor conditions of the adults is currently in progress.

Laboratory research on factors associated with larval food and feeding indicates that wild larvae may not have adequate amounts of the correct food items available to them. In the developmental period when the highest mortality occurs, wild larvae depend exclusively on small zooplankters to meet their physiological needs. Wild striped bass larvae showed distinct preferences for cladocerans, Cyclops sp. and Eurytemora sp., in estimated daily rations ranging from 0.183 to 4.151 calories per larva per day, depending on age and size. Although field data are not extensive, estimates of zooplankton densities in the nursery areas show a decline in abundance and a change in faunal composition. These factors further support the hypothesis that food may be a limiting factor.

Early life stages of striped bass exposed to chronic low levels of petroleum-based hydrocarbons in the laboratory showed the ability to take up and bioaccumulate these compounds rapidly. When larvae were burdened with the added stress of starvation, the toxicant caused significantly greater mortalities. Other fat soluble toxicants (such as PCBs and chlorinated organics) may also act in this way. Analyses of adult fish caught in the estuary provide evidence that a variety of toxicants, including aromatic hydrocarbons, PCBs, and chlorinated organics, are present somewhere in the system and are being taken up by these animals. Whether these compounds are directly affecting eggs and larvae remains unclear. Nonetheless, their susceptibiity from a laboratory standpoint has been established.

Members of the Physiological Ecology Investigation program continue to test these hypotheses and are also currently designing experiments on the combined effects of heavy metals and monocyclic aromatics on early life stages and juvenile stages of bass. Further pollutant analyses and statistical analyses are also underway on autopsied adult fish. The purpose of this research is to clarify associations between poor conditions, reduced reproductive capability, and pollutant contents. This information is needed by resource managers who must decide how best to counter the present deteriorating condition of California striped bass stocks.

SOUTHWEST REGIONAL DATA MANAGEMENT AND ADP OPERATIONS

Computer System Transfers to UCSD

Dorothy Roll, Systems Analyst, reports that the SWFC has been instructed by NOAA and the Department of Commerce ADP Policy Division to move all data and program files off the INFONET system for implementation on the University of California, San Diego, Burroughs and VAX computer system. The ADP Policy Division at NOAA and DOC approved the Southwest Fisheries Center's request for the computer staff at the La Jolla Laboratory to control, monitor, and implement all the data and program file transfers from the INFONET system. This permission supersedes the provision in Computer Sciences Corporation's (CSC) contract which states that on termination of services, CSC controls and implements the file transfers to magnetic tapes based on the subscriber's instructions on codes and formats.

The ADP Procurement Branch in DOC has set May 1, 1981, as the deadline for the completion of all file transfers from INFONET. To meet this target date, the porpoise technical staff is reviewing and identifying the data and program files to be moved from the porpoise account and is assigning the priority levels for the systematic transfer from INFONET to UCSD's VAX system. Approximately 65% of the data and program files in non-porpoise programs have already been transferred to magnetic tapes for access by UCSD's Burroughs or VAX systems.

Considerable time was consumed in resolving data errors encountered in the tape transmission of blocked data records from INFONET to VAX. With assistance from consultants at CSC and UCSD, Computer Programmer Bob Butler determined that a blocking factor of 18 on output from INFONET is required.

During this computer transition period, ADP operations is hosting a meeting with the computer technical staff every Thursday. The purpose of the meetings is to air technical problems, to disseminate information on the resolution to these problems, and to exchange knowledge on the capabilities of the Burroughs and VAX systems. Serving as consultants, ADP operations will be responsible for resolving technical problems and will develop cost-effective software utilities, such as file management procedures.

A letter has been sent to Ed Coughran, Director of UCSD's computer center, to identify the center's updated computer requirements formally due to the shift of all workload onto the Burroughs/VAX systems. Some of the needs addressed were 1) available disk space to accommodate 250 megabytes, the estimated volume of data for input and output files; 2) additional ports to accommodate the current 18 dial-up terminals for access to Burroughs, VAX, and CATT systems; and 3) insured quick response time during prime hours.

Development of North Star Micro-Computer Progressing

Several developments toward completion of the North Star micro-computer system took place this month, reports LT. Mark Sullivan, NOAA Corps officer assigned to Fred Kellenberger, Data Systems Manager. Of note is the set-up and testing of a modem to operate with a phone jack which communicates at 300 or 1200 bps with most dial-up computer centers. Programming is being developed at the contractor's site for the system's software. Testing will be done on the North Star in the SWFC's ADP workroom.

ORION Station Capacity Expanded

The shipboard ORION (Oceanographic Research Interactive Onboard Network) system was set up this month to handle a 720 station cruise. This is three times the estimated maximum number of stations defined in the development specification. The ORION system was modified to handle the additional stations.

Part of PACES to Convert to ADP Network

ADP Network Services has received a contract to convert part of the Pacific Cooperative Enforcement System (PACES) from INFONET to ADP Network. In the first phase, the initial step is to establish an interface between the computers at the California Department of Fish and Game in Long Beach, California, and the ADP Network in Waltham, Massachusetts. The second step is the creation of edit routines for the data entries of vessel registrations and fishing licenses into their respective data bases.

Tapes Generated on Salmon Fishery and California Sportfish Data

Bob Butler completed the generation of tape data for Sermin Hardesy, Sea Grant trainee, and Leon Garoyan, Economist, of UC Davis. The tape file contains data extracted from the Coastwide Data System, and summarized price and landings by vessel class, ports, and the five major salmon species.

Oden Burris produced a tape of the 1977 California sportfish data for Richard Parris of the Pacific Environmental Group, Monterey. The file contains catch/effort statistics which were processed and analyzed according to Parrish's specifications.

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Final typing of the Center's Cruise Planning Manual was completed this month and submitted to the Deputy Director for approval. This manual is a source of NOAA Office of Fleet Operations instructions, foreign and state department notices, and the Center Director's procedures for arranging and executing a NOAA cruuise.

MISCELLANEOUS

Design Proposals Sought for SWFC Solar Demonstration Project

Ben Remington, Executive Officer, reports that the Source Solar Demonstration Project Source Evaluation Board at the Southwest Fisheries Center met on January 28 to review proposals and hear presentations by two of the three engineering firms selected as best qualified. Both presentations were judged to be inadequate by the Board because they lacked the specificity needed to make a determination. The Board recommended that the Center seek a Concept Design Proposal from each of the competing firms. These proposals are due in March and are expected to provide the information required to select the contract.

The Solar Demonstration Project, funded by a $278,625 grant from the Department of Energy, will provide solar heating for aquarium sea water used in the various biological studies at the La Jolla Laboratory. Depending upon the final design, heating of space within the same buildings as the aquaria may also be provided. The project is scheduled for completion by December 1981.

HONORS AND AWARDS

Honolulu Laboratory

The following Honolulu Laboratory employees received Special Act Award certificates:

Shoji Teramoto (Fishery Methods and Equipment Specialist), "for work as liaison with the skipjack tuna fishermen who supply the Laboratory with live specimens of tunas" (summer 1980).

Thomas K. Kazama (Fishery Biologist), who "through his long hours of work was able to insure that all parts of the skipjack tuna project study came together at the proper time and place" (summer 1980).

Martina K. K. Queenth (Biological Technician), "for the biopsy procedures she was responsible for to monitor the sexual maturation states of Laboratory brood stock of wild fish. . ." (summer 1980).

Darryl T. Tagami (Biological Technician), received a Special Achievement Award based on his Outstanding Performance rating earned for his overall superior performance and his "ability to deal with complex problems usually assigned to biologists in higher grades. . . ."

PUBLIC AFFAIRS

Tiburon Laboratory

On February 20, Maxwell Eldridge, Supervisory Fishery Biologist, gave a tour of the Tiburon Laboratory, and a presentation of the research work conducted here, to the Water Pollution Biology Class from Humboldt State University, Arcata, California. The 20 students were primarily interested in approaches made toward assessing impacts of toxicants on fishes.

SEMINARS

La Jolla Laboratory

February 26 - R. V. ("Trey") Walker, College of Fisheries, University of Washington, presented a talk on "The fishery for dolphins and small whales in the Lesser Antilles."

Tiburon Laboratory

February 12 - Philip Meyer of Meyer-Zangri Associates, Davis, CA spoke on "Compensatory values for fish and wildlife in California's Central Valley." The joint San Francisco State University/Tiburon Laboratory seminar was held at the Tiburon Laboratory.

24 - Thomas G. Yocom, Fishery Biologist at the Environmental Assessment Branch (Southwest Region) talked about "Impacts of the California Water Project on fishery resources." This joint San Francisco State University/ Tiburon Laboratory seminar was held at the Tiburon Center for Environmental Studies (San Francisco State University).

TRAINING

La Joll Laboratory

February 23-27 - Barbara Watkins, Purchasing Agent, "Small Purchasing and Federal Supply Schedules," San Francisco, CA.

Tiburon Laboratory

February 17-19 - Linda Bradley, Clerk Typist, "Federal Travel Regulations," GSA, San Francisco, CA.

18 - Jeanne Hurst, Administrative Clerk, "Federal Travel Regulations," GSA, San Francisco, CA.

VISITORS

Honolulu Laboratory

February 5 - Randolph K. C. Chang and Tamio Otsu provided a tour of the Kewalo Research Facility for Chief Officer Ishii, 3rd Officer Meguro, and 11 students from the Hokusei Maru.

9 - Dr. Dayton L. Alverson, Managing Partner, Natural Resources Consultants, Seattle, Washington, visited Director Richard Shomura, T. Otsu, and Richard Uchida.

13 - Captain S. Yamamoto, Master of the University of Hokkaido's Hokusei Maru, and Dr. T. Suzuki visited R. Shomura and T. Otsu.

19 - Dr. Richard Brock, Hawaii Institute of Marine Biology, visited R. Shomura to discuss Dr. Brock's possible use of the Honolulu Laboratory's small vessel, Kaahele'ale.

- Dr. Richard Radke visited R. Shomura to discuss a tentative research proposal.

20 - R. Shomura and Dr. Adams met with S. Fougner and J. Rutka, Western Pacific Regional Fishery Management Council (WPRFMC), to discuss ongoing and projected contracts for socio-economic studies.

23-27 - Ping Shan Huang, Council for Agricultural Planning and Development, Taiwan, visited Heeny S. H. Yuen.

La Jolla Laboratory

February 3 - Malcolm J. Silverman, NMFS, Woods Hole, MA.

19 - Robert M. Chandler, San Diego Natural History Museum, San Diego, CA.

23 - Robert V. Walker, College of Fisheries, University of Washington, Seattle, WA.

25 - Howard Braham, NWAFC, Seattle, WA.

- Hal Merry, NEFC, Woods Hole, MA.

- Mel Odemar and Dan Miller, CF&G, attended State/ Federal meeting on coastal marine mammals at the La Jolla Laboratory.

Tiburon Laboratory

February 6 - Malcolm J. S. Iverman, NMFS, Woods Hole, MA.

9 - Fred Craves, Waters Association, Greenbrae, CA.

13 - Edward F. Fortune, Jr., and Jack Gordon, California Striped Bass Association, Stockton, CA.

20 - Ray Swanson, Horizon Fish, Corte Madera, CA.

22 - K. Ishida, Tokyo, Japan.

23 - S. Ohgami, S. F. Trading Company, Oakland, CA.

26 - A. B. Pace, Mike Snodgrass, and Joseph B. Williams, General Services Administration, San Francisco, CA.

- F. Harrison, J. Lam, and D. Rice, Lawrence Livermore Laboratory, Livermore, CA.

27 - Hal Hess, U.S. Geological Survey, Rohnert Park, CA.

Pacific Environmental Group

February 9 - Dr. John Allen and Dr. R. L. Smith, Oregon State University, Corvallis, OR.

- Dr. Paul Smith and Larry Eber, Southwest Fisheries Center, La Jolla, CA.

9-11 - Dr. Omar Rojas, Instituto de Fomento Pesquero, IFOP, Santiago, Chile.

25-26 - Lt. Hector Soldi, Peruvian Navy, Lima, Peru.

26 - Dr. Izadore Barrett, Director, Southwest Fisheries Center, La Jolla, CA.

MEETINGS AND TRAVEL

Honolulu Laboratory

February 5 - Heeny Yuen attended a meeting of the University of Hawaii Sea Grant Marine Program Committee for Information Acquisition and Transfer.

6 - Laboratory Director Richard Shomura returned to Honolulu after attending the 28th meeting of the WPRFMC in Saipan and Guam.

9 - R. Shomura, Richard Uchida, Howard Yoshida, Dr. Jerry A. Wetherall, Dr. Robert Skillman, Dr. Michael Adams, and Western Pacific Program Office personnel attended a briefing on fisheries matters, including the status of present negotiations with entities of the former Trust Territory of the Pacific Islands, given by Morris Busby, Deputy Assistant Secretary of State for Fisheries, Department of State, Washington, D.C.

13 - R. Uchida represented Laboratory Director R. Shomura at a briefing given by the Hawaii Institute of Marine Biology to enhance communication among scientists with common areas of interest.

14 - R. Shomura and Walter Matsumoto attended a reception on the Hokusei Maru.

17-18 - In cooperation with the WPRMFC, the Honolulu Laboratory hosted a meeting to review the fishery statistical systems of the Hawaii Division of Fish and Game and the Honolulu Laboratory, to aid contractors who will be gathering similar kinds of data in American Samoa and the Northern Mariana Islands. Participants included Arnold Palacios from the Northern Mariana Islands, William Coleman from American Samoa, and Nancy Wong from the Republic of Belau.

24-27 - R. Shomura participated in the 1981-83 Biennium Sea Grant Site Visit at the University of Hawaii.

La Jolla Laboratory

January 26-February 6 - Dr. Izadore Barrett, Center Director, traveled to Honolulu, Palua Island, Guam, and Saipan to attend Western Pacific Council meetings.

January 30-February 1 - Dr. Gary Sakagawa traveled to San Luis Obispo, CA to participate in an AFS panel on Marine Mammal/Fishery Interaction.

January 30 - Dr. Doug DeMaster traveled to Santa Cruz, CA to partic-
February 2 pate in radio tagging research on elephant seals.

February 2- 4 - Wayne Perryman traveled to Santa Barbara, CA to evaluate film projection equipment at the UCSB Remote Sensing Laboratory.

4 - Larry Eber and Dr. Paul Smith traveled to Monterey, CA to coordinate pelagic ecology and environmental fishery research at Pacific Environmental Group (PEG)

3- 4 - Dave Mackett, Dr. R. M. Laurs, and Dr. Norm Bartoo met with Roy Mendelssohn and Dick Parrish of the Pacific Environmental Group for an albacore workshop at the La Jolla Laboratory.

4 - Alec MacCall met with J. Radovich, D. Stevens, D. Kohlhorst and B. Collins in Stockton, CA to discuss and develop an integrated striped bass model.

6- 9 - Richard Butler traveled to Panama City, Panama, to oversee installation and alignment of the super apron on M/V Eliza M.

8-14 - Dave Mackett, Planning Officer, presented a lecture series at CICIMAR in La Paz, Mexico.

9-11 - Bessie Robinson from ADP Network Services, the NOAA-wide timeshare system, conducted a 3-day training session at the La Jolla Laboratory for the technical staff in the Center's auditorium on Data Base 1022 and data management system on ADP Network.

10 - Doyle Hanan and Alec MacCall met with CF&G and NMFS scientists to discuss shark and billfish analyses.

10-12 - Fred Kellenberger traveled to Seattle, WA to attend the Pacific Coast Fisheries Data Committee meeting and to meet with NWAFC data management personnel.

11 - Alec MacCall, Robson Collins, James Messersmith, and various fishery and industry representatives attended a workshop in Long Beach, CA convened by the Director of the California Department of Fish and Game for the purpose of developing a mutually acceptable bonito management legislation.

16-18 - Dr. Daniel Huppert traveled to Coos Bay, OR to attend the Pacific Council's SSC meeting.

- Dr. Izadore Barrett, Center Director, traveled to Coos Bay, OR to attend the Pacific Council's SSC meeting,

and to Seattle, WA to meet with Chief of Personnel Services, NASO.

20 - Dr. Gary Sakagawa participated in a Coastal Marine Mammal planning session with Southwest Region personnel at the La Jolla Laboratory.

24 - Doyle Hanan and Alec MacCall met with D. Bedford (CF&G, Long Beach) to discuss shark/swordfish observer logbooks.

25 - A State/Federal meeting on coastal marine mammals was held at the La Jolla Laboratory. Attendees included: Dr. Gary Sakagawa and Dave Mackett from SWFC, Mel Odemar and S. Dan Miller from CF&G.

26 - Dr. Izadore Barrett, Director, La Jolla Laboratory, traveled to Monterey, CA to meet with Gunter Seckel, Chief of the Pacific Environmental Group, and Colin Pittenbrigh, Director, Hopkins Marine Station.

26 - Dr. Angeles Alvariño, a member of the EEO Committee at the La Jolla Laboratory, attended a meeting of the Hispanic Employment Program Managers and Coordinators of the various Federal agencies in San Diego County, in San Diego, CA.

27 - Jim Squire traveled to Laguna Niguel, CA to give a slide presentation entitled, "The distribution of billfish in the Pacific Ocean and their relation to the southern California resource" at a meeting of the Dana Angling Club.

Tiburon Laboratory

February 3 - Norman J. Abramson, Dr. Jeannette A. Whipple and the Physiology staff, and Nina Hirsch (San Francisco State University) met with Dr. Robert Burns (OMPA) and Dr. Herb Curl (PMEL), Seattle, WA, to discuss coordination of the Cooperative Striped Bass Study and the NMFS, Tiburon Physiological Ecology Investigation, with related environmental research being done at PMEL.

3-10 - Sus Kato and Patrick Rutten (NOAA Corps) traveled to Avila Beach, CA to participate in a chartered fishing cruise aboard the F/V Sanibel.

4 - Maxwell Eldridge met with colleagues of the California Department of Fish and Game at the Granite Canyon Marine Laboratory, Monterey, CA to discuss procedures for bioassays with heavy metals.

10-11 - Dr. Jeannette A. Whipple and Maxwell Eldridge traveled to Stockton, CA to attend a meeting with personnel of the California Department of Fish and Game.

17-19 - Dr. William H. Lenarz participated in a meeting of the Groundfish Management Plan Development Team and the Pacific Fishery Management Council in Coos Bay, Oregon.

18 - Susan Pollock delivered octopus fishing gear to cooperating fishermen in Fort Bragg, CA.

19 - William Leet and Sennen Salapare traveled to Bodega Bay, CA to fish for euphausiids aboard the commercial trawler Seal.

24-25 - Norman J. Abramson traveled to Palo Alto, CA to attend a meeting of the Pacific Fishery Management Council's Pink Shrimp Management Plan Team. The Team worked on a final draft of the Plan which is to be considered by Council at their May meeting.

26 - The Physiological Ecology Investigation staff met at the Tiburon Laboratory with Dr. Florence Harrison, Jackie Lam, and Dave Rice, Lawrence Livermore Laboratory. The main purpose of the meeting was to discuss respective research and to develop cooperative activities during the upcoming experimental season.

Pacific Environmental Group

February 2- 5 - Drs. Richard Parrish and Roy Mendelssohn traveled to La Jolla, CA to attend the Albacore Workshop.

- Dr. Douglas McLain traveled to Boulder, CO to attend the EPOCS meeting.

19 - David Husby traveled to King City, CA to present a talk to the King City High School civics class.

23-25 - Gunter Seckel traveled to La Jolla, CA to attend the Ocean Sciences Board Meeting on Long Time Series of Ocean Measurements.

Members of the 1981 EEO Committee at the La Jolla Laboratory are shown in the above photo: (left to right) Angeles Alvarino, Lorraine Zorich, Al Myrick, David Au (chairperson), Susan Walker, Eric Lynn, and Betsy Stevens.

PERSONNEL ACTIONS

Honolulu Laboratory

February 5 - Donald C. Aasted, Fishery Methods and Equipment Specialist, Resignation

8 - Robert B. Moffitt, Biological Technician (Fisheries), Promotion

- Darryl T. Tagami, Biological Technician (Fisheries), Promotion

11 - Jiro Morisako, Fishery Methods and Equipment Specialist, 30-day extension of special-need appointment.

La Jolla Laboratory

February 8 - Veronica Breda, Travel Clerk,
Promotion

- Ken Wallace, Computer Specialist,
Quality Step Increase

22 - Virginia Cass, Fishery Biologist,
Converted to Excepted Appointment

- Henry Orr, Scientific Illustrator,
Promotion

- Shari Sitko, General Biologist,
Converted to Temporary Appointment (NTE 9/25/81)

Tiburon Laboratory

February 14 - Mark Kobe, Biological Technician,
Expiration of Appointment

22 - Michael J. Bowers, Biological Technician,

Promotion

UNITED STATES
DEPARTMENT OF COMMERCE

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